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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/591,974	09/08/2006	Keisuke Suzuki	023312-0128	4959

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EXAMINER	
FIERRO, ALICIA	

ART UNIT	PAPER NUMBER
1626	

MAIL DATE	DELIVERY MODE
01/14/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/591,974	SUZUKI, KEISUKE	
	Examiner	Art Unit	
	Alicia L. Fierro	1626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 October 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) *8-12 and 16-20* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7,13 and 14* is/are rejected.

7)☒ Claim(s) *15* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of the Claims

1. Currently, Claims 1-20 are pending in the instant application. Claims 8-12 and 16-20 remain withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a non-elected invention. Claims 1-7 and 13-15 read on an elected invention and are therefore under consideration in the instant application.

Priority

2. Receipt of the certified translation of the foreign priority document is acknowledged. It has been entered into the record.

Response to Amendments and Arguments

3. Applicant's arguments and amendments filed October 2, 2009 have been fully considered and entered into the application. All rejections and objections not explicitly maintained herein are withdrawn.

Claim Objections

4. Claim 14 is objected to for the following informalities:

   a. In the definition of R1, the claim states that R1 may be substituted by C_1 to C_5 alkoxy, which variable is recited three times in this portion of the claim. The second and third repetitions of the phrase should be deleted.

b. In the definition of R4, the claim states the R4 may be a C1 alkenyl group or a C1 alkynyl group. Each of these groups require at least two carbons since they require multiple bonds to be present. Appropriate correction is required.

5. Claim 15 is objected to for being dependent on a rejected base claim but would be allowable if rewritten in independent form including all limitations in the base claim and any intervening claims.

Claim Rejections - 35 USC § 112

(second paragraph)

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 4 and 14 are rejected under 35 U.S.C. 112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. Regarding claim 4, the phrase "such as" renders the claims indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d). Applicants state that the claim does not recite this phrase; however, the phrase is present in line 2 of the claim.

b. Regarding claim 14, the claim states that R^3 can be a C_1 to C_{10} alkyl group. There is insufficient antecedent basis for this limitation in the claim when R^3 is C_1 to C_5 alkyl.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

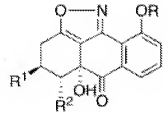
> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 1-7 and 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hachisu et al. (*J. Amer. Chem. Soc.* 2003, 125, pp.8432-8433), which has a publication date of June 21, 2003, in view of Bachman et al., *Journal of the American Chemical Society*, Vol. 57, No. 6, June 1935, pp. 1095-8.

5. Hachisu et al. teach compounds of the following formula, as well as methods of preparing the compounds utilizing a benzoin condensation mechanism:



6. The preparation methods disclosed by Suzuki et al. can be very lengthy (e.g. up to 44 hours for the reaction mechanism taught in Scheme 2). The compounds taught by Hachisu et al. differ slightly from those in the instant claims. Particularly, the instant R4 position is required to be a hydroxy group in the prior art compounds. Although R4 cannot be hydroxy in the instant claims, C1 to C10 alkoxy groups are possible. Specifically, hydrogen and methyl are deemed to be obvious variants of each other. *In re Wood*, 199 USPQ 137. Further, it has been established by the case law that the interchange of an alkyl group and hydrogen, in and of itself, is obvious. *Ex Parte Bluestone*, 135 USPQ 199.

7. Hachisu et al. do not disclose the instantly claimed production method wherein a compound of Formula (IIa) or (IIb) is treated under acidic conditions. In the claimed method, the ketone group is formed via a Pinacol rearrangement. The Pinacol rearrangement reaction is a method which is well-known in the art for being a quick and efficient method of synthesizing ketone compounds. Bachmann et al. disclose that diaryldihydrophenanthrenediols were successfully rearranged to 9,9-diaryl-phenathrolines via treatment with a hot solution of iodine in acetic acid, without the formation of any undesired byproducts (p.1095, "Rearrangement of the Pinacols"). Although a specific temperature for the reaction is not discussed, it is disclosed that the solution is "hot" (p. 1095), and also that the reaction takes place at reflux temperature for one hour. Further, water is taught as a solvent (p.1097, "Rearrangement of the Pinacols"). There is no evidence provided in the Bachmann reference to suggest that the reaction temperature would be outside the instantly claimed range. However, it is also noted that changing the temperature of a reaction would be considered routine

optimization of a known method to a person of ordinary skill in the art and is therefore not considered inventive, absent a showing of criticality or unexpected results.

8. The motivation to make the instantly claimed compounds from the instantly claimed method derives from the expectation that structurally similar compounds would possess similar chemical activity (i.e. compounds possessing "important and potent" biological activities as disclosed by Hachisu et al.). Thus, it would have been *prima facie* obvious at the time the invention was made for one of ordinary skill in the art to produce H/alkyl analogs of the compounds taught by Hachisu et al. with a reasonable expectation of success. Motivation to develop an alternative mechanism by which to synthesize the preanthroquinone compounds of Hachisu et al. would have been provided by the Hachisu et al. reference which states that "Chemical methods for the stereocontrolled synthesis of fused-ring polyacetates currently lag far behind recent innovations in the assembly of their macrocyclic counterparts," suggesting an art-recognized problem of synthesizing the reference compounds. The motivation to specifically use the pinacol rearrangement reaction to produce the instantly claimed compounds is the fast reaction time (i.e. one hour), as disclosed by Bachmann et al., which led to an efficient ketone synthesis without the formation of any undesired byproducts. Therefore, it would have been prima facie obvious at the time the invention was made for a person of ordinary skill in the art to use the pinacol rearrangement method taught by Bachmann et al. to produce obvious variants of the compounds taught by Hachisu et al. in order to obtain the claimed compounds in a faster reaction time with no formation of undesired byproduct.

Conclusion

9. No claims are allowed.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alicia L. Fierro whose telephone number is (571)270-7683. The examiner can normally be reached on Monday - Thursday 6:00-4:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Joseph McKane can be reached on (571)272-0699. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Alicia L. Fierro/
Examiner, Art Unit 1626

/Golam M. M. Shameem/

Primary Examiner, Art Unit 1626